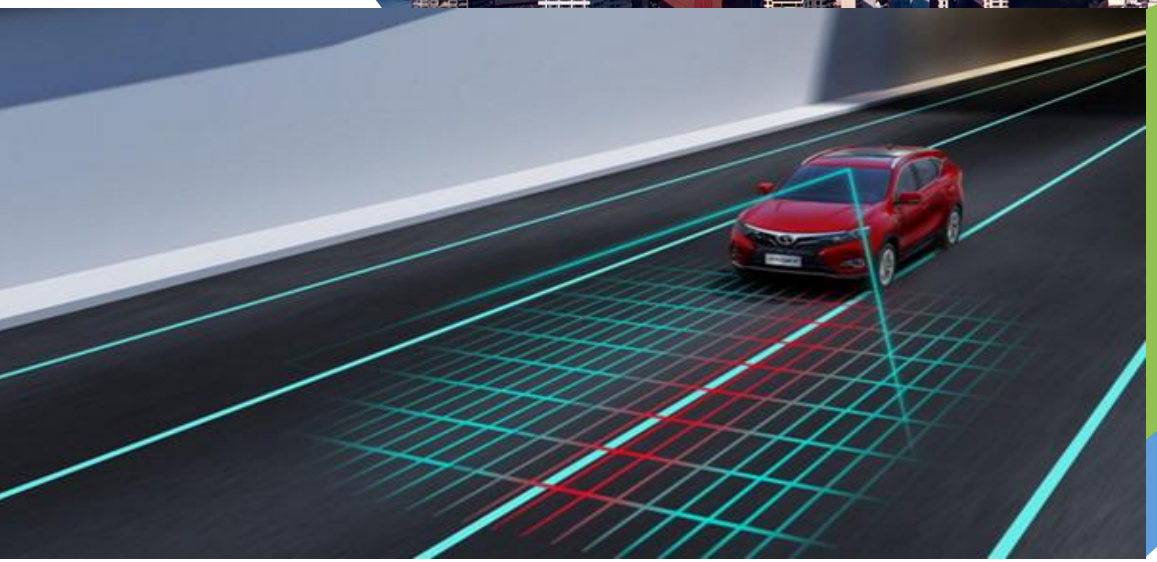

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Smart Car OTA Industry Report, 2024-2025

Dec. 2024

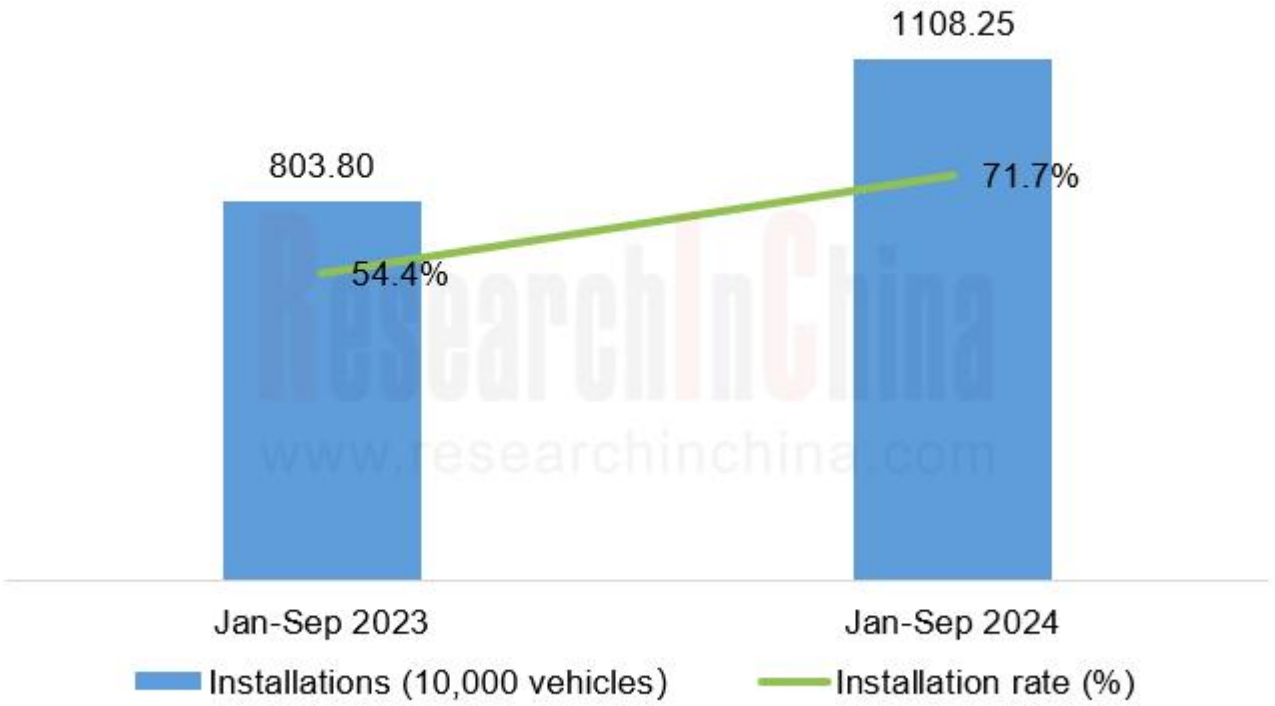
Automotive OTA research: With the arrival of the national mandatory OTA standards, OEMs are accelerating their pace in compliance and full life cycle operations

Automotive OTA research: With the arrival of the national mandatory OTA standards, OEMs are accelerating their pace in compliance and full life cycle operations

The rising OTA installations facilitate rapid adoption of new intelligent technologies such as AI foundation models and NOA in vehicles.

From January to September 2024, 11.083 million passenger cars carried OTA function in China, a year-on-year surge of 37.9%; the installation rate hit 71.7%, up about 17.3 percentage points year on year. With an increasing number of intelligent vehicles, the installation rate of OTA in passenger cars in China is expected to reach more than 90% by 2030.

OTA Installations and Installation Rate in Passenger Cars in China, Jan.-Sept. 2024



Source: ResearchInChina

NOA Layout of Major OEMs via OTA Updates, 2024

With the increase in OTA installations, OTA updates occur frequently. Compared with 2023, OTA updates for vehicles in 2024 become far more frequent. Some OEMs conduct OTA updates monthly with a wider coverage. Moreover, OTA updates in 2024 involve much more intelligent driving functions.

Most OEMs have regarded intelligence as an important selling point of their cars. Thanks to OTA technology, new intelligent technologies from OEMs can be installed into cars faster. For example, many models launched in 2024 enable new intelligent driving functions such as NOA and AEB via OTA updates, and they will continue to be optimized and improved.

NOA Layout of Major OEMs via OTA Updates, 2024

OEM	Jan 2024	Feb 2024	Mar 2024	Apr 2024	May 2024	Jun 2024	Jul 2024	Aug 2024	Sep 2024	Oct 2024
Xpeng		Unlimited XNGP added	XOS 4.6.0 XNGP optimized		XOS 5.1.0 Highway NGP optimized		XOS 5.2.0 Map-free XNGP pushed			
Li Auto	OTA 5.0.2 optimizes highway / urban NOA		OTA 5.1 optimizes highway / urban NOA				OTA 6.0 adds map-free NOA OTA6.1 optimizes NOA	OTA6.2 upgrades highway NOA of AD Pro		
Xiaomi						V1.2.0 adds urban NOA (10 cities) & optimizes highway NOA	OTA 1.2.3 NOA optimized	1.3.0.11 adds the pioneer edition of urban NOA		V1.4.0 activates urban NOA experience
AITO		V3.3.8.9 adds map-free urban NCA	Urban NCA optimized	Urban NCA optimized					NCA optimized	HUAWEI ADS 3.0 NCA added
NIO	Aspen 3.5.0 / Banyan 2.4.0 optimizes global NOP+						Banyan 2.6.5 optimizes NOP+	Banyan 3.0.0 optimizes NOP+ & Pilot+		

Source: ResearchInChina

OTA updates speed up and hardware OTA updates further improve user experience.

In addition to the ever-increasing range of hardware covered by OTA updates, the hardware, network and other configurations of new models have been improved, and OTA dual-partition technology has been applied. The OTA technical performance of new models also becomes ever better, which is specifically reflected in multiple aspects such as update speed, optional update time, and failsafe in update.

For example, in terms of OTA update speed, multiple OEMs have clearly required faster OTA updates in new architectures or new models.

OTA Update Speed Increase Plans of Major OEMs

Time	~2023	2024	2025~
Xiaomi Auto		• The entire cockpit system can be upgraded in as little as 3 minutes. • The entire vehicle can be upgraded in as little as 30 minutes.	• -
Xpeng	• **A vehicle update in less than 30 minutes**	• **OTA update is 300% faster.**	
Tesla	• -	• 25 minutes (an intelligent driving and cockpit domain update)	• -
NIO	• 90 minutes (an intelligent driving domain update)		• Vehicle update is faster. It only takes 30 minutes to update the whole vehicle.
Changan Automobile	• A vehicle control domain software update: ≤3min (Deepal)		• A user-perceived OTA update takes less than 20 minutes. • A user-perceived core controller update takes less than 1 minute.
SAIC	• OTA download and installation takes a few minutes to 2 hours		• OTA update is 70% faster. • OTA download and installation takes less than 30 minutes.
FAW Hongqi	• -		• A comprehensive update in 3 minutes, 85% faster
Chery	• -		• The update of 3 computing centers takes less than 15 minutes, and the update of 53 controllers takes less than 1 minute. • A vehicle OTA update takes less than 30 minutes.
Dongfeng Voyah	• 55 minutes (a cockpit and intelligent driving domain update) • An IVI system update lasts 40 minutes.		• The IVI operating system update is 20% faster.

Source: ResearchInChina

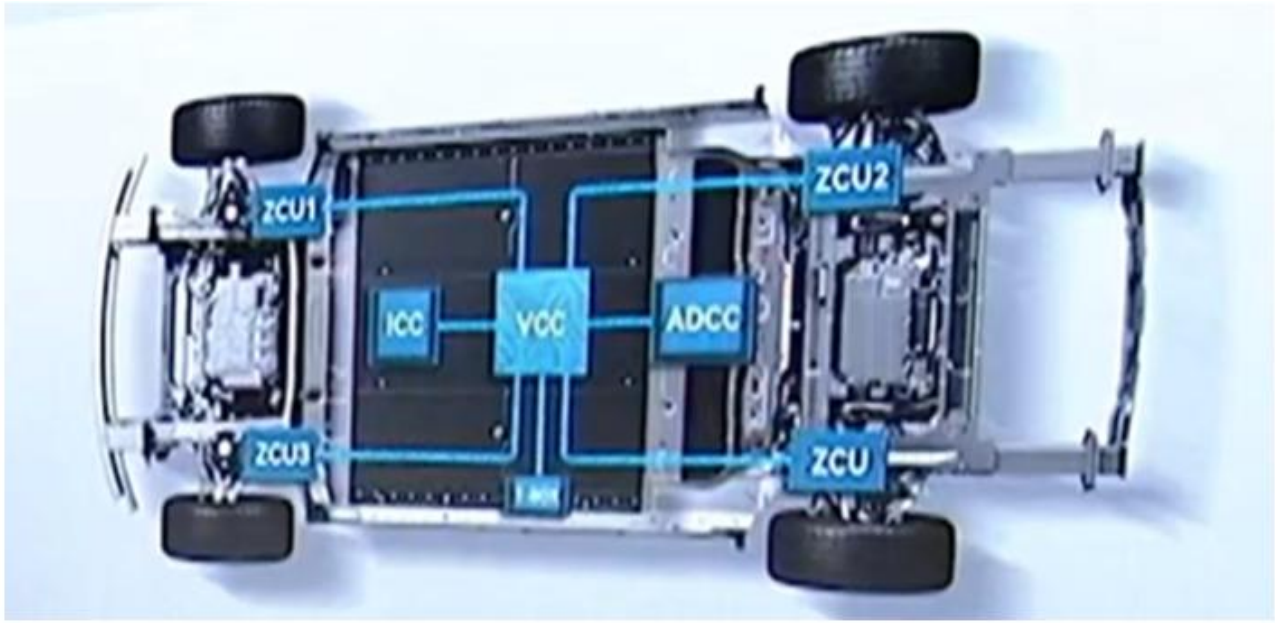
Xiaomi SU7 adopts innovative streaming update technology

Xiaomi SU7, launched on market in 2024, adopts innovative streaming update technology, which can be downloaded and installed at the same time. It can update the whole cockpit system in 3 minutes and the entire car in 30 minutes. OTA dual-zone backup and flashing is not only faster, but also safer and more reliable.

Source: Xiaomi Auto

Chery would join hands with Huawei to build an intelligent base

In October 2024, Chery announced that it would join hands with Huawei to build an intelligent base. The base will adopt the new-generation electrical architecture Mars Architecture, feature Gigabit Ethernet and 1000TOPS computing power, and enable vehicle OTA update within 25 minutes and the one-time success rate of 99.9%.

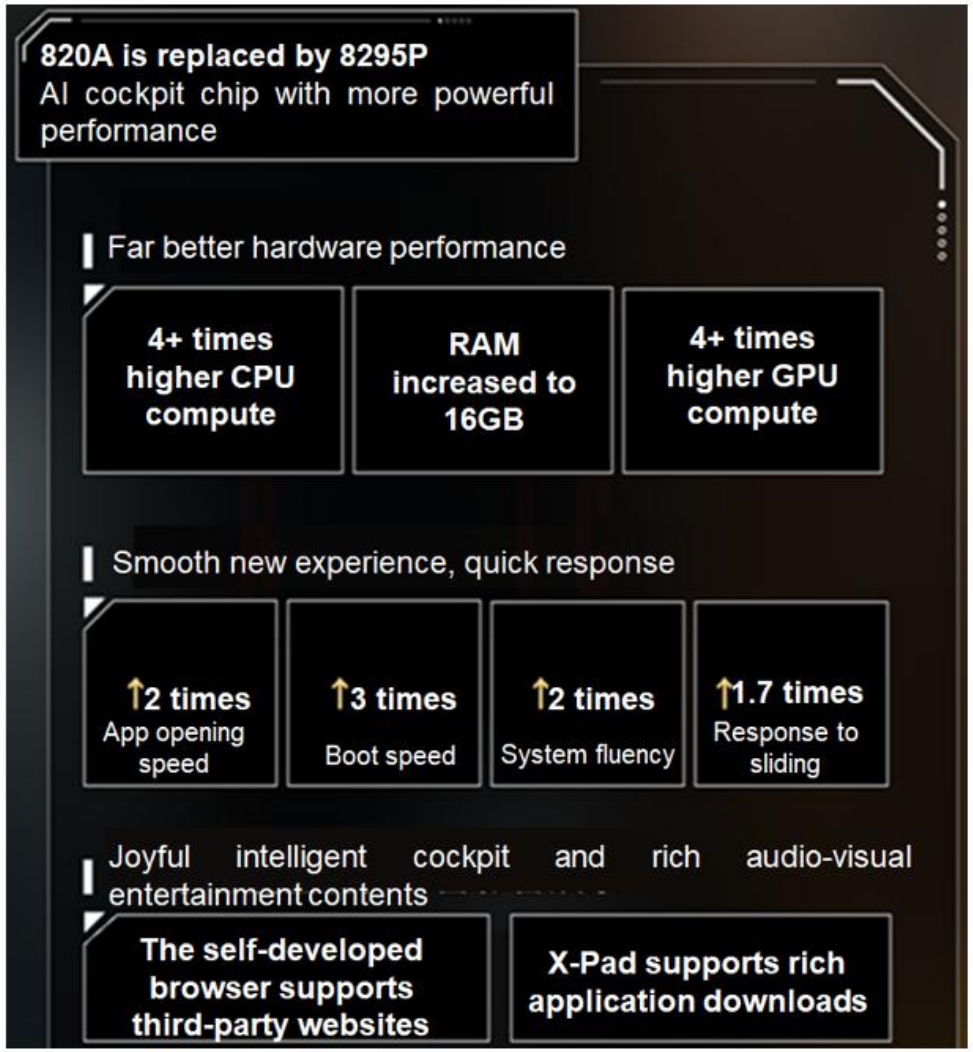


Source: Chery

In addition to the improvement and evolution of software technology, faster OTA updates also require hardware with better parameters, such as higher-compute chips, HPC, shorter wire harnesses, higher bandwidth, and faster communication download speed. Therefore, to improve user experience and OTA updates, some OEMs have proposed hardware update plans for old models.

Xpeng officially launched a crowdfunding campaign for chip renewal for old car owners

In November 2024, Xpeng officially launched a crowdfunding campaign for chip renewal for old car owners. The original car chip Qualcomm 820A was updated to Qualcomm 8295 which is also used in Xpeng P7+ and Xpeng X9, and the RAM was increased from 8G to 16G. The chip upgrade not only improves boot speed and system fluency, but also offers the latest AI Dimensity system to old models such as Xpeng P7 via OTA update.



Source: Xpeng

Regulatory policies and standards are increasingly improving, and there is an urgent need for OTA update compliance.

On August 1, 2024, the Ministry of Industry and Information Technology of China issued the Notice on Further Strengthening the Administration of Access, Recall and Online Software Update of Intelligent Connected Vehicles (Draft for Comments), which aims to further reinforce the management of the access, recall and online software update (OTA) of intelligent connected vehicles equipped with combined driving assistance systems.

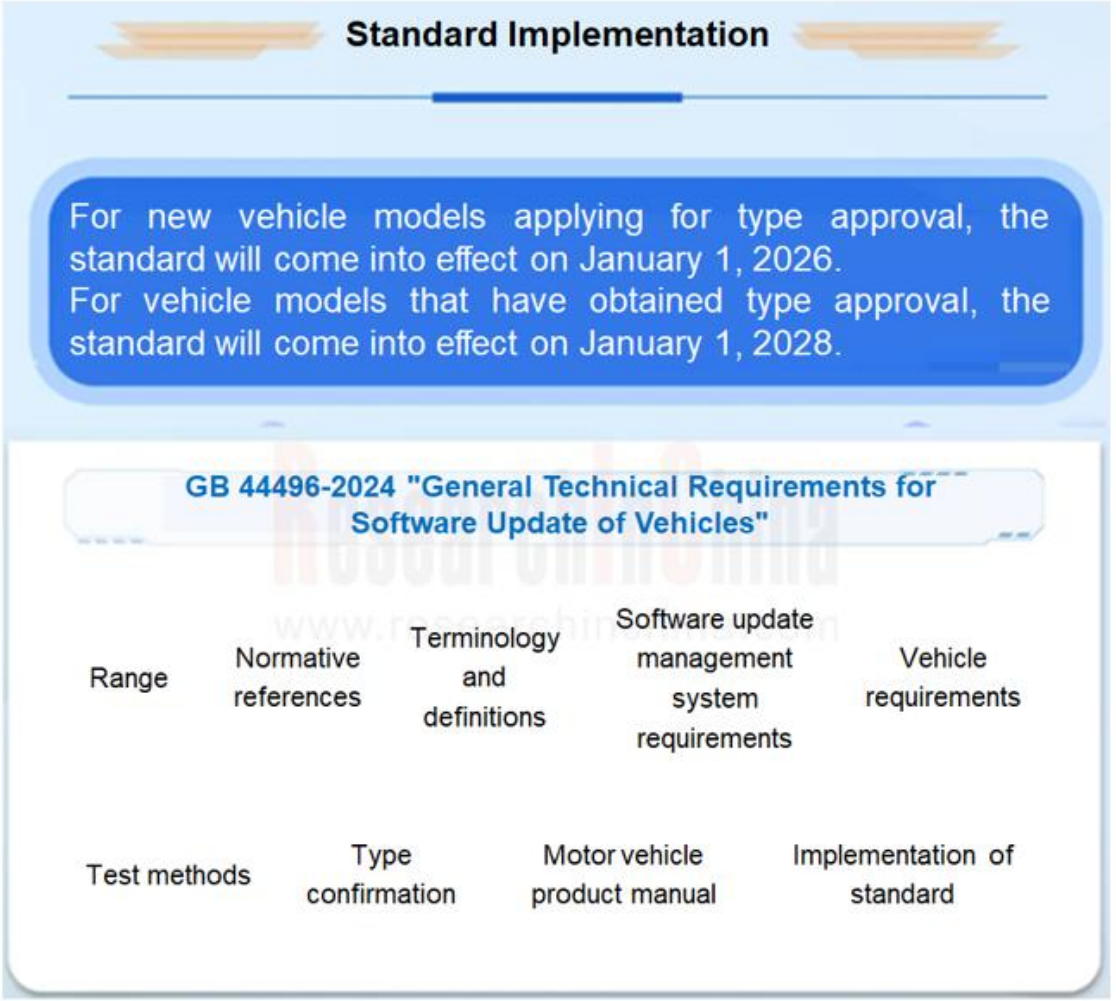
The draft suggests strengthening the supervision and administration of OTA updates, and standardizing the application modes and technical parameters of OTA updates. For automotive software update systems, it requires that information such as the name and storage location of electronic control systems that involve OTA, and OTA software version compilation rule files should be sorted out and filed; during OTA update, traceability management of software should be supported.

This also means that when the notice is officially implemented, OTA registration supervision will be more perfect and comprehensive, posing new requirements to OEMs and making compliance more important.

On August 23, 2024, the national mandatory standard GB 44496-2024 "General Technical Requirements for Software Update of Vehicles" was officially released. It requires that starting from January 1, 2026, all newly launched models must meet this standard; starting from January 1, 2028, all existing models must also comply with this standard.

Regulations and Standards

In addition to the national standard, multiple regulations and standards such as Software Update Management System (SUMS) required by UN WP.29 R156 and ISO24089 have been also gradually implemented, making OEMs demand OTA technical compliance more urgently. In this regard, automotive OTA suppliers such as ABUP and CAROTA have also stepped up their efforts on OTA update compliance.



Source: Ministry of Industry and Information Technology of China

Layout of Major Suppliers in OTA Technical Compliance

Supplier	Compliance
Harman	☐ Provide comprehensive support for WP.29 OTA and cybersecurity, including the compliance design of OTA solutions and automotive cybersecurity solutions. ☐ Provide international regulatory consultation.
Airbiquity	☐ The OTAmatic Vehicle Configurator allows automakers to know the exact hardware and software configurations within a vehicle, manage known combinations of electronic control units (ECUs) and software versions in vehicles, and meet governments' compliance requirements for systems of vehicles for type approval.
KPIT	☐ WP.29 Cybersecurity Vehicle Regulation Compliance
ABUP	☐ OTA testing and verification capabilities ☐ OTA compliance services ☐ A full lifecycle management platform with the global architecture ☐ A minimal compliance system ☐ CMMI Level 3 and ASPICE-2
CAROTA	☐ Focusing on the compliance simulation tests in domestic and foreign OTA-related regulations and referring to the Software Update Management System (SUMS), the company has developed an OTA life cycle management platform solution with the "supplier-vehicle type-OTA task" as the main framework. ☐ Build a compliance management platform ☐ OTA software testing, OTA software updates, OTA licenses and subscription services, updated remote diagnosis, and security of intelligent connected vehicles
Excelfore	☐ Domestic and foreign regulations ☐ Support for overseas OTA of OEMs.
Bosch ETAS	☐ Help OEMs implement "local to global" development plans through regulations, compliance and consulting. ☐ Support OEMs' long-term overseas expansion plans.
Desay SV	☐ Provide a full life cycle OTA service system. ☐ ASPICE CL 3 ☐ The OTA cloud platform has been certified by National Security Protection Level 3 and ISO 27001 information security management system. ☐ Vehicle OTA solutions in line with ASIL D functional safety

Source: ResearchInChina

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